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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	**Robert C. Beck**	Examiner:	**Mendez, M.**
Serial No.:	**09/637,529**	Group Art Unit:	**3763**
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Title	**Catheter**		

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Preliminary Amendment

and Response to Restriction Requirement

RESTRICTION

In response to the restriction requirement, the applicant elects without traverse the invention of Fig. 1 and Fig. 2. The catheter 10 of fig. 1 and Fig. 2 moves within the sheath 24 and it may operate inside the sheath or outside the sheath to aspirate embolic materials. Fig. 1 shows the "injector' 12 that provides fluid under pressure to the catheter and the collection vessel 2 which connects to the sheath 24 for collection the injected fluid once mixed with the embolic material. All of the claims are directed to the **catheter** the and the **catheter and sheath** combination both as apparatus and methods of use.

Claims 18-29 were presented with the case as originally filed and have been presumably renumbered as 11-22.

New claims 30 through 33 are presented with this amendment and restriction response.

AMENDMENTS

Please enter and examine new claims 30 though 33:

18. A catheter system comprising:

an ablation catheter having a catheter body said catheter body having a distal tip said distal tip having a first maximal diameter;

a sheath having a internal lumen said lumen having a diameter substantially equal to said first diameter of said ablation catheter;

said ablation catheter located within said sheath and adapted for motion with respect to said sheath;

whereby said ablation catheter body can be moved independently of said sheath.

19. A catheter system according to claim 18 wherein said internal diameter of said sheath is slightly larger than said first diameter of said ablation catheter.

20. A catheter system according to claim 18 wherein said internal diameter of said sheath is substantially equal to said first diameter of said ablation catheter.

21. A catheter comprising:

a catheter body having a proximal end and having a distal end;

said catheter body defining an axis;

said distal end having an approximately circular cross section;

a high pressure lumen in said catheter body terminating near the distal end;

an annular aperture encircling the distal end of the catheter body, connecting the high pressure lumen with the exterior surface of said catheter body;

said annular aperture defining a first aperture direction for the emerging flow that lies between approximate zero degrees and one hundred and eighty degrees

said annular aperture cooperating with said catheter body to direct an annular sheet of fluid emerging from said aperture along said catheter body such that said distal end is substantially encircled with fluid from said aperture.

22. The catheter of claim 21 wherein said annular aperture is formed by a set of individual holes.

23. The catheter of claim 22 wherein said set of individual holes are substantially equidistant around the periphery of said distal end of said catheter.

24. The catheter of claim 23 wherein said holes are approximately round in cross section.

25. The catheter of claim 23 wherein said holes are approximately rectangular in cross section.

26. The catheter of claim 21 further including :

a control body surface located immediate adjacent said aperture, providing a barrier located proximate said aperture, for limiting fluid entrainment from the location of said control body, near the aperture by the jet emerging from the aperture, whereby said jet is deflected by a pressure difference across said barrier.

27. A catheter comprising:

a catheter body having a proximal end and having a distal end;

a high pressure lumen located in said catheter body;

a series of apertures communicating with said high pressure lumen;

said series of aperture substantially completely encircling said distal end;

a control body formed in said catheter body adjacent said series of apertures blocking fluid entrainment from the area proximal of said apertures by a jet emerging from said apertures.

28. The catheter device of claim 26 wherein a tangent drawn to said control body surface at the location of the aperture is parallel to the aperture direction.

29. The catheter device of claim 26 wherein a tangent drawn to said control body surface at the location of the aperture forms an included angle with the aperture direction that is greater than zero degrees and less than ninety degrees.

30. A extraction catheter system for removing embolic material comprising:

a sheath having a sheath lumen adapted to receive and guide a catheter;

said catheter having a catheter body having a distal end and a proximal end and having an interior and an exterior surface;

a fluid supply lumen in said catheter body;

a fluid port connecting said fluid supply lumen with the exterior surface of said catheter body;

said fluid port and said body cooperating to attach fluid ejected from said fluid port to said body;

whereby said fluid ejected by said port mixes with embolic material and follows the

catheter body in a retrograde direction, transporting the fluid and embolic material into said sheath lumen.

31. The catheter system of claim 30 wherein said catheter distal end is located within said sheath lumen.

32. The catheter system of claim 30 wherein said catheter distal end is located outside said sheath lumen.

33. A method of using a catheter system to remove material comprising:

advancing a sheath having a sheath lumen to a location near material to be removed;

advancing a catheter of the type having a fluid port to eject fluid thus creating a retrograde flow, through said sheath lumen to a location near material to be removed;

injecting fluid into said catheter causing fluid to emerge from the catheter, entraining material located near said catheter;

removing said fluid and entrained flow from said sheath lumen.

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